CONTRIBUTIONS OF DIGITAL HRM TO ORGANIZATIONAL PERFORMANCE: SYSTEMATIC REVIEW WITH A PARADOX PERSPECTIVE

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ABSTRACT

Impacts of the application of digital technologies to perform HRM activities or digital HRM vary among multiple levels of organizations. However, the extant literature has mainly concentrated on the benefits of digital HRM for improving HRM functional performance. By using a paradox perspective, the study aims to systematically review and synthesize organizational level impacts of digital HRM. Consistent with previous studies, this study found mixed impacts of digital HRM on organizational performances with skewed attention towards positive sides. By examining paradoxical tensions such as productivity, openness or privacy embedded in digital HRM implementation that have been sparsely mentioned in digital HRM research, the study provides additional explanations for variation in digital HRM impacts and practical implications for organizations.

Keywords: Digital HRM, Organizational Outcomes, Paradoxical Perspective, Literature Review.

INTRODUCTION

Rapid evolution of information technology and widespread coverage of internet have reshaped the way organizations operate and do business by allowing them to define new ways of collecting, organizing and collaborating resources that enable innovative solutions such as new products or new business models (Elia et al., 2020). Competing in today world of turbulence and depletion of resources, organizations have increasingly considered human resources to be an important source of their competitive advantages (Nyathi & Kekwaletswe, 2023). Therefore, using digital technologies to perform human source management (HRM) practices efficiently and effectively becomes more crucial to achieve and sustain organizational competitiveness than ever before.

However, empirical research has indicated that HRM digitalization can generate both positive and negative impacts at different levels of organizations: individual, HRM function and corporate (Theres & Strohmeier, 2023). For example, while digitalization of HRM can improve employee productivity (Iqbal et al., 2019), organization innovation (Jani et al., 2023); HRM efficiency (William & Singh, 2023), it can increase work-related stress (Blom et al., 2019) and reduce quality of communication or social relationship in organizations (Chugunova and Danilov, 2022). Despite its variant impacts, extant literature has mainly focused on the positive side of the use of digital HRM technologies (Nayak et al., 2022). Considering the importance of digital HRM, some systematic literature reviews on its consequences in organizations have been conducted. However, majority of them such as Zhou et al. (2022) and Bondarouk et al. (2017) focused on HRM function level. Theres & Strohmeier (2023) is one of few reviews that

synthesize consequences of digital HRM at different levels. However, this review focused more on the positive side than the dark side of HRM digitalization.

Therefore, the study aims to systematically review and synthesize the existing literature on impacts of digital HRM at corporate level by using a paradox perspective. This approach is meaningful because focusing on the linkage between digital HRM and organizational outcomes can help digital HRM strategies less vulnerable to managerial cynicism that is rooted from long perception of HRM as a supporting function (Bassi, 2011). Moreover, because of paradoxical nature of organizational life, focusing on two sides of the impacts of digital HRM can foster critical thinking, learning and thereby generating creative insights or solutions that support organizational changes (Lewis, 2000).

The study is structured into three main sections. The next section is a literature review on the conceptualization of digital HRM and paradox, followed by a section for research methodology and findings. The study then concludes by suggesting some future research areas.

LITERATURE REVIEW

Definition of Digital HRM

Digital technology is a broad concept that can be described in three distinct but related elements: digital artifacts such as apps or software/hardware, digital platforms such as Apple's iOS or Google's Android, and digital tools and systems such as data analytics, social media (Nambisan, 2017). Digital technologies have been applied to perform HRM tasks since the second half of 20th century (Theres & Strohmeier, 2023). Their possibilities are numerous, ranging from a very operational technology that automates manual HR tasks such as HRIS or payroll system to sophisticated technology that is able to simulate human behaviors and automate decision making processes such as artificial intelligent or algorithm (Martin & Reddington, 2010 ; Vrontis et al., 2022; Theres & Strohmeier, 2023). They not only act as tools that support employees to carry out their jobs and administrative tasks such as recruitment screening, or updating personal leaves, but also provide platforms that facilitate collaboration and communication among employees, connect employees with different resources for self-development and other recreation needs (Manivannan and Mohan, 2014).

In order to cover this wide range of application of digital technologies to perform HRM tasks, the concept of digital HRM, which is broader than e-HRM, has been recently adopted (i.e Zavyalova et al., 2022; Theres & Strohmeier, 2023). Digital HRM or HRM digitalization can be divided into three types: (i) operational application that is using digital technologies to support administrative HR practices such as recruitment, compensation; (ii) strategic alignment that refers to the usage of digital technologies to support the execution of HR strategy; and (iii) strategic integration that means incorporating digital technologies in defining HR strategies, thereby contributing value to overall digital business strategies (Strohmeier, 2020). Performance consequences of digital HRM depends not only on technology but also contextual factors such as industry type, workforce skills and human usage of technology (Strohmeier, 2020).

Paradox Theory

Paradoxes can be defined as contradictory but interdependent elements that are constructed and recognized through self-reflection or social interaction (Lewis, 2000). They are

persistent, dynamic and created across different levels of organizations (Schad et al., 2016). As technology advances rapidly and competition becomes more intense, organizations are increasingly encountering more paradoxical challenges (Loon et al., 2019) that derive from both managerial decisions and the demand of market and stakeholders imposed on organizations (Clegg et al., 2002). Literature identifies four types of paradoxes that organizations normally face: learning, organizing, belonging and performing (Schad et al., 2016). Learning paradoxes depict tensions emerged in the process of sense making, innovation and transformation. Organizing paradoxes denote tensions between competing but simultaneously demanding designs and processes to achieve a desired goal. Belonging paradoxes refers to tensions between the self and other or between competing identities (Lewis, 2000). Finally, performing paradoxes emphasize different outcomes resulting from tensions between stakeholder's different demand or interpretation of outcomes (Schad et al., 2016). Different types of paradoxes can be nested, reinforce each other and emerge together. For example, contradictory elements in organizing paradoxes can spur a performing paradox in which employees are required to perform competing goals, which may then create a learning paradox - tensions between capability development for future and present (Smith & Lewis, 2011).

The contradictory but interconnected nature within and between paradoxes has two important implications. On the one hand, if paradoxes are not attended or managed effectively, they can cause chaos, conflicts or ambivalence in organizations and can eventually lead to organizational decline and collapse (Schad et al., 2016). On the other hand, although paradoxes are not detrimental to organizations, managing it requires a holistic approach (Schad et al., 2016). Being aware of them and learning how to engage and respond to them effectively can prevent organizations from falling into simplicity trap (Clegg et al., 2002) while fostering more open and insightful search for interconnections or interrelationship between opposing forces that serve as a means to generate more creative solutions or enable strategic changes (Lewis, 2000).

METHOD

In order to ensure the transparency, reproduction and objectivity of data collection, analysis and synthesis process (Kraus et al., 2020), the study followed steps suggested by (Tranfield et al., 2003).

Identifying Studies

The study used keyword string: (*"Digital human resource*" OR "digital* HRM" OR "e-HRM" OR "electronic human resource*") AND ("consequences" OR "impacts" OR "effects" OR "outcomes" OR "benefits" OR "values" OR "advantages" OR "disadvantages" OR "drawbacks" OR "dark side" OR "risks" OR "adversities" OR "pitfalls")* to search in title, abstract and keywords in Web of Science Core collection and Scopus database. These two databases are selected for its popularity in the academic community (Klang et al., 2014) and its user friendliness compared to other databases such as Proquest or EBSCO. Moreover, while Web of Science is one of the oldest citation databases, Scopus offers a wider coverage compared to Web of Science and SciFinder (Li et al., 2010).

The list of studies appearing after keyword searching was limited to those that are written in English and are classified as "article" and "review" in document classification. These two document types are selected for their standardized formats and recognized impacts in scholarly

discourse (Klang et al., 2014). The author also referred to reference lists in other articles to identify additional papers that may be relevant but omitted by the keyword search.

Selecting Studies

The list of publications was filtered further for their relevance to the review's goal by using inclusion criteria guided by Newbert (2007) as follow:
1. Title of the paper needs to contain at least one word related to using digital technology in the context of HRM such as digital HRM, e-HRM.
2. Abstract of the paper needs to contain at least one word describing impacts of digital HRM on organizations and individuals.
3. Full text of the paper can be downloaded and provides theoretical explanations related to the relationship between digital HRM and its consequences Table 1.

Table 1 OUTLINES THE PROCESS OF IDENTIFYING AND SELECTING PUBLICATIONS AND TOTAL NUMBER OF PUBLICATIONS FOR FINAL ANALYSIS		
Step	**Detail**	**No of publication**
Identification	Records identified by using keyword string	322 (Web of science = 107, Scopus = 215)
Screening	Record remained after removing duplication	248
Eligibility	Record remained after title screening	216
	Record remained after abstract screening	88
Included	Record remained after full text screening	62
	Cross reference	11
Total number of articles for final analysis		73

The review included both empirical, conceptual and review papers in order to provide more comprehensive knowledge related to the topic.

Table 2 SHOWS CATEGORISATIONS OF PAPERS SELECTED FOR FINAL ANALYSIS		
Type of papers		**% of 73 papers**
Empirical	Quantitative	52%
	Qualitative	19%
	Mixed method	3%
Conceptual		16%
Review		10%

Because HRM digitalization is a socio-technical process (Strohmeier, 2020), the study included papers reflecting impacts of digital HRM on individuals that aggregately influence

organizational outcomes in order to cover more aspects of the dark side of digital HRM at corporate level Table 2.

Synthesizing Findings

The study applied thematic analysis approach outlined by Nowell et al. (2017) to capture important content of data, identify similarities and differences between findings of publications and then categorize them into themes about organizational outcomes of digital HRM. The paradox lens are used to reveal interconnectedness and contradiction between elements within each theme, thereby reflecting negative impacts of digital HRM on organizations. To select a name for a paradox, the study triangulates with studies in other fields such as IT or statistics to minimize conflicting interpretation.

FINDINGS

The impacts of digital HRM on organizations can be attributed to three distinct but interrelated mechanisms: " (i) automation – replacing human effort and skill by technology; (ii) information – creating purposeful insights that increase human understanding, decision, and control; and (iii) collaboration – enabling human communication and cooperation across space and time" (Theres & Strohmeier, 2023). Due to the complex and dynamic nature of the interaction between human and technology, performance consequences of digital HRM can be both negative and positive, and change over time (Strohmeier, 2020). However, the review only found cross-sectional studies that focus much on positive impacts of digital HRM. The findings are categorized into three broad themes: organizational efficiency, organizational innovation, organizational effectiveness. Within each theme, different paradoxical tensions are presented.

Organizational Efficiency

"Efficiency refers to getting the most output from the least amount of inputs or resources" (Robin and Coulter, 2018:8). Through automation, organizations can reduce costs and time spent on a number of manual and administrative HRM tasks such as resume screening, record filing, facility renting, job advertising, or travel costs (Johnson and Stone, 2019), which contributes to overall organization's efficiency. Chugunova and Danilov (2022) found that 75% of respondents agreed and strongly agreed that digital HRM tools enabled them to complete their tasks faster. In terms of sub-functions of HRM, Cober et al. (2000) indicated that online recruitment reduced recruitment costs by 89% and recruitment time by 25%, while Zhang & Nunamaker (2003) estimated online or e-learning reduced total training costs by 40% by eliminating travel costs. Another direct contribution to organization's cost savings due to automation of HRM practices is reduction in the number of HR staff (Iqbal et al., 2019; Ruël et al., 2004; Bondarouk et al., 2017). However, this reduction was found insignificant (Parry & Tyson, 2011). The application of digital technology also allows information or messages about HRM to be stored and made available consistently to employees and business units (Bondarouk et al, 2017; Parry &Tyson, 2011) from common shared service platforms or self-service portals operating across space and time (Martin & Reddington, 2010). As a result, standardization (Parry & Tyson, 2011), transparency and clarity of HR policies and practices within organizations (Iqbal et al., 2019) is improved, which ultimately increases organizational efficiency.

However, because of the overlapping nature of some administrative activities such as registration and information distribution among departments (Manivannan and Mohan, 2014), in the long run digitizing HRM can lead organizations to encounter a productivity paradox due to shifting responsibilities or workload across departments and employees in the organizations. Some studies such as Bondarouk and Ruel (2013), Martin & Reddington (2010) reported workload related to HR activities are transferred from HR personnel to line managers and employees due to the introduction of digital HRM. Line managers even worried that over time line managers would spend all of their time on covering up administrative tasks left by the HR function.

Organizational Innovation

Innovation that can be defined as the process of creating and implementing something new and meaningful for adopters. It is considered to be key for organizations' competitiveness in turbulent and uncertain business environment (Assink, 2006). Digital HRM can contribute to organizational innovation by enhancing organizational capabilities for learning and knowledge management. Specifically, it acts as a means to encourage and enable employees to adopt continuous learning so as to adapt to changing business environment and a means to allow organizations to assemble, integrate and deploy valuable knowledge resources (Njoku & Ebie, 2015). Al-Hawary et al. (2020) found positive relationship between e-HRM measured by sub-functions: e-training and development, e-recruitment and selection, e-performance appraisal, e-compensation and e-communication and organizational learning capabilities. Through automation of HR administrative tasks, employees can have more time focusing on high-value tasks that are found to more likely to foster creativity than administrative or routine tasks (Anderson et al., 2014). Through information and collaboration mechanism, digital HRM can motivate employee's self-learning habits by allowing them to access different training resources both internal and external and learn at their own pace, to receive faster and more regular performance feedback and to exchange information and share ideas within organizations (Hamidianpour et al., 2016; Lin, 2011). Employee's motivation for self-learning can be reinforced when they are supported by competence-based appraisal and group-based rewards (Lopez-Cabrales et al., 2011). Self-learning together with open communication enhances knowledge building and sharing within organizations, which plays an important role in organizational innovation process (Anderson et al., 2014).

The application of digital HRM technology also facilitates organizational learning and knowledge management by allowing organizations to adopt modern and nonhierarchical organizational structures such as holonic structure or virtual organization structure. Holonic structure refers to a network of different self-organizing teams (Ravarini & Martinez, 2019), while virtual organizational structure refers to "a collection of geographically distributed, functionally and/or culturally diverse entities that are linked by electronic forms of communication and rely on lateral, dynamic relationships for coordination" (DeSanctis and Monge, 1999: 693). These structures are characterized by a distributed decision-making process, constant interaction and communication, and diversity of thoughts and perspectives that are crucial factors for organizational innovativeness (Lin, 2011; Ravarini & Martinez, 2019). Ravarini & Martinez (2019) indicated that top managers considered e-HRM as a central factor in developing holonic organizational structure. Lin (2011) found that virtual organizational

structure had direct positive impacts on organizational innovation while strengthening the relationship between employee creativity and organizational innovation.

Although the direct relationship between digital HRM and organizational innovation has been explored, the relationship is limited to considering organizational innovation as one aspect of organizational performance or by deduced through employee innovation and creativity. Moreover, the findings about the relationship are inconsistent. For example, while Masum et al. (2020) and Barišić et al. (2019) found a positive relationship between e-HRM or HRIS adoption and organizational performance in which innovation scale was included, Satispi et al. (2023) failed to report the relationship between HRIS adoption and employee innovation.

Despite benefits of the permeability of organizational boundaries that is enabled through smooth flow of information and knowledge among employees for organizational innovation, it leads organizations to encounter a paradox of openness – a tension between value creation and capture (Zobel &Hagedoorn, 2020). Specifically, organizations struggle between the requirement for centralization to control a large number of relationships occurred in the new flexible organizational structure and the necessity of decentralization to maintain autonomy for each node or holon in that network relationship. Having a large number of relationships, organizations also experience identity tension between in-groups (core part of structure or employees) and out-groups (partners or contingent workers) (Greenberger and Wang, 2002). Social identity theories indicate that identity can be formed by individuals' innate characteristics or social interaction between persons and environment (Schlegel et al., 2012). Therefore, loss of physical interaction (Ore and Sposato, 2021) and the difficulty to identify authenticity of entities in virtual communities or platforms (Suen and Chang, 2017) are likely to intensify identity tensions in organizations. Although these identity tension intensifiers can be mitigated by advancements in digital technology that can enrich social atmosphere in virtual space (Suen and Chang, 2017), Thite (2022) emphasized that those advancements cannot replace high touch by traditional HRM practices because not all employees or people are able to learn or comfortable using those high techs (Suen and Chang, 2017).

Organizational Effectiveness

Organizational effectiveness has been defined differently Dhoopar et al. (2023) for a review). However, in general, it refers to goal attainment or "do the right things" (Robin and Coulter, 2018). Through information and collaboration mechanisms, digital HRM can contribute to organizational effectiveness by improving the capabilities of both managers and employees to make better, timelier decisions (Shamout et al., 2021). Hunitie et al. (2023) found positive direct and indirect relationship between e-HRM and organizational effectiveness.

Applying digital technology to perform HRM practices enables organizations to collect, store and analyze a large amount of information about current and prospective employee's behaviors and attitudes (Ore and Sposato, 2021), which provides more insights for managerial decisions. For example, McIver et al. (2018) found that collecting and analyzing data through e-recruitment and selection helped organizations improve hiring quality and store performance. Moreover, advanced digital technologies such as algorithms or artificial intelligence reduce human involvement in decision making, thereby improving perceived objectivity, justification

and consistency of decisions, which are pivotal for legal compliance (Tambe et al., 2019; Ore and Sposato, 2021).

However, increasing availability and accessibility of numerous information that is relevant and potentially useful brings managers paradox of choice (Bawden & Robinson, 2009). The Reuters survey of business managers indicated that nearly half of respondents believed that having too much information spoiled or delayed important decisions (Bawden & Robinson, 2009). Instead of providing more insights, too much information makes decision makers feel cognitive overload and anxiety (Bawden & Robinson, 2009). They struggle to filter information, to verify its reliability, especially information collected from open source or platforms such as social media Bissola and Imperatori in order to avoid mistakenly excluding relevant and useful information (Bawden & Robinson, 2009).

Relying on a data driven approach or algorithm for decision making can also lead to the paradox of discrimination. Instead of improving objectivity, bias or discrimination in decisions is reinforced more consistently across organizations. Managers or coders can intentionally or unintentionally insert their personal or cultural bias into automated decision-making models.

Gupta et al. (2022) found that employees believed that top management's bias against middle and low-level employees led to exclusion of their demands and needs into the digital HRM system. Biased algorithms can also come from pressure to maximize profits or find optimal solutions for business problems (Angrave et al., 2016).

Finally, collecting a large pool of information through digital HRM can make organizations more vulnerable to a privacy paradox. Employees feel they are constantly tracked by a device (Blom et al., 2019). For example, although using AI, smart health devices and mobile application to collect employee health and wellness data helps HRM practitioners to improve wellness and health of employees and create sustainable behavior changes, these digital wellness solutions are criticised for infringing employee's privacy and security (Chapano et al., 2023).

DISCUSSION

Consistent with previous literature reviews, the study found mixed impacts of digital HRM at organizational level. On the one hand, it contributes to organizational efficiency, organizational innovation, organizational effectiveness and other positive outcomes such as organizational commitment (Alshibly & Alzubi, 2022; Bissola & Imperatori, 2014), job satisfaction (Nyathi & Kekwaletswe, 2023), profitability and market share (i.e Barišić et al, 2019; Jani et al., 2023). On the other hand, it generates workplace conflicts over ownership of HR tasks, social categorisation between in-groups and out-groups, anxiety or diversity reduction. The study also supports previous reviews that research attention has skewed toward benefits of digital HRM and paradoxical challenges that are inherent in digital HRM implementation have been discussed to a limited extent. Another interesting finding is that despite the important role of organizational innovation in today's business environment and disruptiveness of digital HRM (Priyashantha, 2023), only few research has explored the relationship between digital HRM and organizational innovation. Organizational learning and knowledge management mechanisms underlying this relationship have been limited to conceptual discussions. Paradoxes of openness

associated with flexible or boundaryless organizational structure and its interaction with other paradoxes have not been attended yet.

Theoretical Contribution

The findings provide additional support to the assumption that digital HRM can enhance the strategic role of HRM in organizations, and indicate mechanisms underlying this relationship. Moreover, Strohmeier (2020) indicated the dynamic and divergent nature of e-HRM consequences is due to the interaction between human and technology. By adopting paradox theory, the study provides additional explanation for the inconsistency and divergence of digital HRM consequences at organizational level, which provides alternative perspectives and solutions to achieve long run success of digital HRM implementation. The study proposes a conceptual framework to illustrate paradoxes nested in the relationship between digital HRM and organizational outcomes (Figure 1).
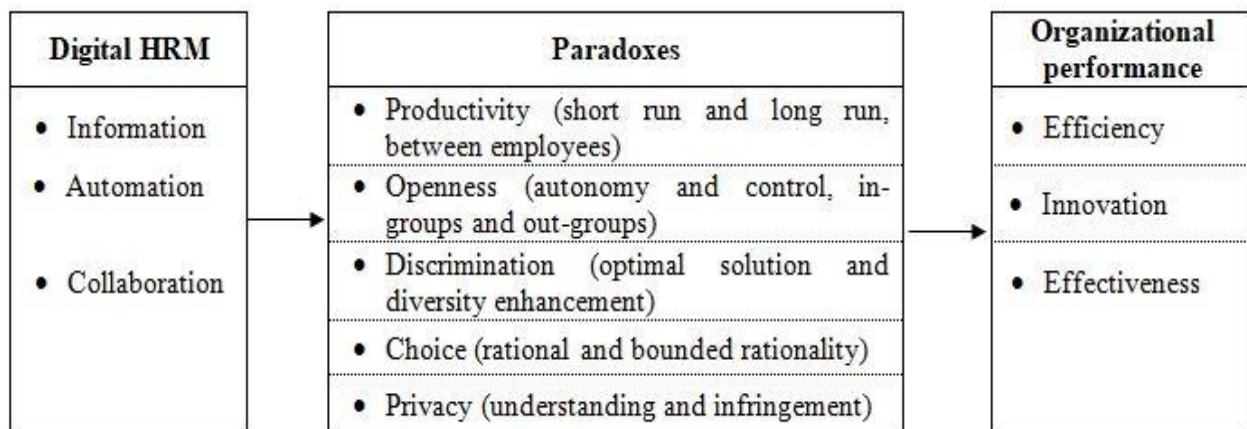
FIGURE 1
PARADOXES AND PERFORMANCE CONSEQUENCE OF DIGITAL HRM AT ORGANIZATIONAL LEVEL

Practical Implication

The results of study provide useful implications for managers and practitioners. First, HRM digitalization does not straightforwardly lead to positive organizational performance, but involves different paradoxes. Second, although digital HRM can be considered to be innovation and its benefits have been applauded, adoption without being aware of different associated paradoxes can lead to inferior performance. Third, because of the interdependent nature of paradoxes, it is necessary to develop integrative approaches to deal with the incurred paradoxes.

LIMITATIONS

The findings of the study may not be exhaustive. First, although Web of Science and Scopus offer a large research coverage, they do not cover all relevant publications. Second, the study does not cover publications that are written in non-English language and have inaccessible

full text. Third, keywords may not cover all operationalization's of the digital HRM concept. Fourth, because the level of performance consequences of digital HRM is conceptualized differently among literature, abstract screening may miss out some relevant articles. Therefore, future review may increase the number of relevant articles by using additional database and keywords, or including articles written in non-English language.

CONCLUSION AND FUTURE RESEARCH

Digital HRM has both negative and positive impacts on organizational performance through information, automation and collaboration mechanisms. Although it can help organizations perform administrative tasks faster and more cost effectively, it may create productivity trade-offs between HR and non-HR personnel that can potentially trigger workplace conflicts. While it can promote organizational innovation through improving organizational capabilities and knowledge management, it can make organizations encounter organizing tensions between control and flexibility, belonging tension between in-groups and out-groups. While it can improve speed, objectivity and accuracy of managerial decisions by collecting a large amount of real-time data and using automated decision systems, it can burden managers with paradox of choice among information and reduce workforce diversity by biased automated decision models. These paradoxes are inevitable when adopting digital HRM, so managers should be aware and learn how to stay with them if they want to achieve positive impacts on organizational performance.

The study suggests some areas for future research on digital HRM. First, considering the importance of organizational innovation and potential benefits of digital technologies, more empirical studies are needed to explore the relationship between digital HRM and organizational innovation and mechanism underlying this relationship. Second, because paradoxes are socially constructed and an essential part of HRM digitalization, it would be useful for organizations if future research explores how organizations shift between opposing poles of paradoxes and achieve a dynamic balance. Third, because of the multi-level nature of paradoxes, it would be practically helpful to extend the research on how different types of paradoxes interact with each other, and how addressing one paradox affects another paradox.

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